

This listing of the claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claims 1-380 (canceled)

381. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein:

an IP transfer network contains two, or more connection servers, and media routers outside said IP transfer network are each connected to terminals having a transmittance and reception function of digital media;

based on ~~the~~ a call setting request from a terminal calling side;

a call setting IP packet is transmitted from a media router on telephone calling side to a connection server on telephone calling side;

said connection server provided on the telephone calling side determines both an IP communication line for an inter-terminal communication within said IP transfer network and a circuit identification code (CIC) for identifying said communication line by employing both a telephone number provided on the telephone calling side and a telephone number provided on the call reception side, and produces an initial address message (IAM) containing said circuit identification code;

said produced initial address message is transmitted to the connection server provided on the call reception side, said connection server on the call reception side transmits a call setting IP packet to the media router on the call reception side, and said media router on the call reception side transmits said call setting IP packet via a media router, a terminal on the call reception side;

said connection server on the call reception side produces an address completion message (ACM);

said address completion message is transmitted to said connection server on the telephone calling side;

when a report of telephone calling operation is received from the media router on the call reception side, said connection server on the call reception side produces a call progress message (CPG); said call ~~pass~~ progress message reaches to said connection server on the telephone calling side; and said connection server on the calling side transmits the report of telephone calling operation of the media router on the call reception side to the media router on the telephone calling side;

upon receipt of a response issued from the media router on the call reception side, said connection server on the call reception side produces an answering message (ANM); said ~~response~~ answering message reaches to said connection server on the telephone calling side; said connection server on the telephone calling side stops a calling signal of the media router on the call reception side; both said terminal on the telephone calling side and said terminal on the call reception side can establish an inter-terminal communication, through both the media router calling side and the media router reception side, to transmit and receive the digital media via said media routers provided on the telephone calling side and the call reception side;

a request for interrupting the inter-terminal communication is transmitted from said media router provided on either the telephone calling side or the call reception side to said connection server; a release request message (REL) is sent from said connection server to another connection server; an interrupt instruction is transmitted from said another connection server to another media router, and on the other hand, a release completion message (RLC) is transmitted from another connection server to said server; and an interrupt completion is sent to a media router so as to release the inter-terminal communication between the two terminals.

382. (previously presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 381, wherein:

an initial address message (IAM), a call progress message (CPG), an answering message (ANM), a release message (REL), and a release completion message (RLC) are transmitted/received between said connection server on the telephone calling side and said connection server on the call reception side, and an address completion message (ACM) is omitted.

383. (previously presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 381, wherein:

after the inter-terminal communication is completed, said connection server acquires an inter-terminal communication record including a circuit identification code (CIC), a communication time instant, and a telephone number, and records the acquired communication record therein so as to be used for a charging purpose and/or an operation/management.

384. (previously presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 381, wherein: said terminal is a telephone set, said digital media is digitalized voice and said media communication is telephone communication.

385. (previously presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 381, wherein: said terminal is an IP terminal, said digital media is characters or digitalized still images and said media communication is IP data communication.

386. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 381, wherein: said terminal is a voice[[-]] and moving image transmission/reception terminal, said digital media is digitalized voice[[-]] and moving image and said media communication is voice[[-]] and moving image communication.

387-391. (canceled)

392. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 381, wherein:

~~said a media router 1 that~~ is in a CATV ~~network~~ gateway, outside said IP transfer network, ~~and which~~ is connected via a communication line to one of said connection server provided in the IP transfer network;

said media router is connected via ~~any one of a CATV line interface and/or a~~ CATV line to the IP terminal, the analog telephone set, the IP telephone set, and the IP voice and image apparatus; and

~~said CATV line contains a communication lower-grated layer specific through the IP transfer network between one of terminals connected to the CATV line[[,]] and owns a function capable of transferring an IP packet in a communication network a terminal connecting to a media router 2 that is connected to the IP transfer network.~~

393. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 381, wherein: dependent type voice and image apparatus 1 which is indirectly connected to a network node apparatus in said IP transfer network, inquires a host name of dependent voice and image apparatus 2 to an IP image dedicated domain name server inside ~~an~~ the IP transfer network via a media router 1 and obtains IP address of said dependent voice and image apparatus 2, then said dependent voice and image apparatus 1 sends voice and image data to said voice and image apparatus 2 via ~~[[a]]~~ said media router 1, the IP transfer network and said media router 2, thereby to carry out a voice and image communication between said dependent voice and image apparatus 1 and said dependent voice and image apparatus 2.

394. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 381, wherein: independent type voice~~[[/]]~~ and image apparatus 1 which is directly connected to a network node apparatus in said IP transfer network, inquires a host name of ~~[[in]]~~ dependent voice and image apparatus 2 to an IP image dedicated domain name server inside ~~an~~ the IP transfer network via a media router 1 and obtains IP address of said ~~[[in]]~~ dependent voice and image apparatus 2, then said independent voice and image apparatus 1 sends voice and image data to said dependent type voice and image apparatus

2 ~~via a media router 1~~, the IP transfer network and ~~said a media router~~ [[2]], thereby to carry out a voice and image communication between said independent voice and image apparatus 1 and said [[in]]dependent voice and image apparatus 2.

395-397. (canceled)

398. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network using a circuit identification code (CIC) to carry out a communication control, wherein:

an IP terminal 1 and a dependent type IP telephone set which is indirectly connected to a network node apparatus are connected via a communication line to a ~~first gateway 1~~, ~~and said dependent type IP telephone set is indirectly connected to a network node apparatus in said IP transfer network~~;

an IP terminal 2 and an IP voice and image apparatus are connected via a communication line to a ~~second~~ gateway 2; and

the terminal-to-terminal communication can be established via said ~~first~~ gateway 1, said IP transfer network, and said ~~second~~ gateway 2 in order that the terminal-to-terminal communication by sending/receiving an IP packet can be made via said gateways 1 and 2.

399. (previously presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 398, wherein:

a plurality of gateway communication interface function units are provided inside said gateway, depending upon communication procedure, so that said gateway communication interface function units can be adapted to various sorts of telephone communication procedures.

400. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 381 399, wherein:

a telephone is connected to a media router provided in a LAN having a telephone number of a public switched telephone network;

a combination of an address telephone number and a transfer gateway telephone number is set in a transfer processing unit of a switching machine; and

said telephone is connected to another telephone machine inside said LAN.

401. (canceled)

402. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network wherein:

an said IP transfer network uses a circuit identification code (CIC) to carry out a communication control and includes two or more network node apparatuses;

a media router is connected to an IP communication line to any one of said network node apparatus;

an internal IP address is applied to a logic terminal of a termination unit on the side of said network node apparatus of the IP communication line;

an external IP address is applied to each of the media routers, and also said media router is connected via a communication line to more than one telephone set;

as a record of an address management table provided in said network node apparatus, both said external IP addresses and said internal IP addresses are contained, and an IP communication record for defining an IP capsulation method is previously set; and

a telephone communication connection control and a telephone communication release control are carried out between the telephone set connected to said media router and another telephone set connected to another media router.

403. (previously presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 402, wherein:

a media router containing a telephone number server is employed, and said telephone number server answers an IP address when a telephone number is inquired.

404. (previously presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 402, wherein:

a telephone call connection phase is carried out by transmitting a call setting IP packet which contains at least a source telephone number and a destination telephone number.

405. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 404 wherein:

a connection control of a telephone call identifier is attained by using a ~~common~~ port number in an IP packet allocated each of a plurality of telephone set[s] and individual voice communication in each telephone set is attained by allocating a different port number to each telephone set.

406. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network using a circuit identification code (CIC) to carry out a communication wherein: an inter-terminal communication for a telephone communication comprising call set request (IAM), call set completion (ACM), call progress (CPG) and answering (ANM) is carried out by transmitting and receiving an IP packet between call sets inside IP transfer network and is moved to a service phase, and said service phase is completed by transmitting and receiving said IP packet between the call sets via a step comprising release (REL) and release completion (RLC), and a record including at least a telephone number, a communication start time and a communication end time is registered.

407-412. (canceled)

413. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network wherein:

~~an~~ said IP transfer network uses a circuit identification code (CIC) to carry out a communication control and includes two or more network node apparatus;

a media router is connected to an IP communication line to any one of said network node apparatus;

an internal IP address is applied to a logic terminal of a termination unit on the side of said network node apparatus of the IP communication line;

an external IP address is applied to each of the media routers, and also said media router is connected via a communication line to more than one telephone set;

as a record of an address administration table provided in said network node apparatus, both said external IP addresses and said internal IP addresses are contained; and

an IP communication record is set in order in said address administration table and a telephone communication is carried out among ~~preselected~~ predetermined companies A-1, A-2, ..., A-N ("N" being larger than 2), so that a ~~closed-area~~ telephone communication can be carried out, and communication destinations of said ~~closed-area~~ telephone communication are limited.

414. (canceled)

415. (previously presented) A method of acquiring an IP address with employment of a terminal-to-terminal communication connection method as claimed in claim 403, wherein:

a telephone number is converted into a domain name format of the telephone number, and an IP address used in telephone communication is acquired from the domain name format.

416-418. (canceled)

419. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network wherein:

~~a communication line for a telephone communication connection control is separated from a voice communication line between a termination gateway equipped with an encapsulation function and a relay gateway; and~~

~~a telephone communication is carried out between two telephone sets via a telephone set 1, a termination gateway equipped with a capsulation function, a relay gateway, a Network to Network Interface (NNI) interface communication line, a public switched telephone network, and a telephone set 2 in this order.~~

the IP transfer network uses a circuit identification code (CIC) to carry out a communication control and includes one or more termination gateway and relay gateway, a connection control IP communication line and a voice IP communication line for
telephones are separated, the termination gateway and the relay gateway respectively
include a connection server, a connection server 1 in the termination gateway and a
connection server 2 in the relay gateway have a function to carry out a connection control
for the telephone communication, the telephone communication between telephones 1 and
2 is carried out via the telephone 1, a communication line, the termination gateway, an
internal IP communication line in the IP transfer network, the relay gateway, a Network to
Network Interface (NNI) communication line, a public switched telephone network, a
telephone line and the telephone 2.

420. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 419 wherein:

the relay gateway includes a relay control unit and a voice control unit, both the
connection servers 1 and 2 include a circuit identification code (CIC) administration
tables respectively,

a telephone number server employed in said termination gateway equipped with ~~the encapsulation function, and a relay control unit employed in the relay gateway own individual Circuit Identification Code (CIC) administration tables;~~ and manage circuit identification codes by employing the respective CIC administration tables.

421. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim ~~420~~ 419 wherein:

the relay control unit includes a signaling point address administration table and
the relay control unit retrieves [[a]]the signaling point address administration table and
indicates a telephone number of a destination telephone set so as to acquire a signaling

point address of such a exchanger in the public switching telephone network for managing said destination telephone set.

422. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 420 419 wherein:
the relay control unit determines a circuit identification code (CIC) and a signaling link selection based upon a rule which is previously determined with respect to the public switched telephone network.

423. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 420 419 wherein:
a conversion between an IP packet and a signaling unit is carried out by employing an address connection table in the relay control unit employed in the relay control unit within the relay gateway, which holds address information contained in an IP packet and label information contained in a signaling unit.

424. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 420 419 wherein:
while using a media connection table contained in a voice control unit provided in the relay gateway, ~~a converting operation between an IP packet for storing digital voice, and a voice signal which is transferred through a voice communication line of the~~ Network to Network Interface (NNI) communication line is carried out. a conversion from a digital voice from the voice IP communication line into a channel signal from Network to Network Interface (NNI) communication line and a conversion from the channel signal into the digital voice are carried out.

425. (currently amended) A relay control unit wherein:
in the method claimed in Claim 423 419, while using an address connection table which contains both address information contained in an IP packet and label information contained in a signaling unit, ~~a conversion operation between the IP packet and the~~

~~signaling unit is carried out. a conversion from an IP packet for connection control into a signaling unit and a conversion from the signaling unit into the IP packet are carried out.~~

426. (currently amended) A voice control unit wherein:

in the method claimed in Claim ~~424~~ 419, while ~~[[a]]the~~ media path connection table, the voice control unit performs a conversion operation between an IP packet for storing digital voice, and a voice signal transferred through a voice communication line of a Network to Network Interface (NNI) communication line.

427. (currently amended) A voice control unit as claimed in claim ~~424~~ 426, wherein:

said voice control unit has an IP address used to transmit and receive a voice IP packet, and said IP address is supplied to set ~~[[a]]the~~ media path communication table.

428. (currently amended) A voice control unit as claimed in Claim ~~420~~ 426, wherein:

said voice control unit secures a logic voice communication line used to receive or transmit from the public switched telephone network.

429. (currently amended) A termination gateway ~~equipped with a capsulation function~~ wherein:

said termination gateway ~~equipped with the encapsulation function~~ includes a relay control unit and a network node apparatus;

~~said network node apparatus owns both an IP encapsulation function and an inverse capsulation function;~~

said relay control unit includes a telephone administration server, a telephone number server, a ~~pilot telephone~~ connection server, and a table administration server; and among IP packets entered from a ~~media router~~ an external line to the network node apparatus, a telephone call control IP packet is transferred to the relay control unit, and a voice IP packet is transferred to a voice IP communication line for a voice communication.

430. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network using a circuit identification code (CIC) to carry out a communication control wherein:

a telephone communication between two telephone sets can be carried out via a telephone set 1, a public switched telephone network 1, a Network to Network (NNI) interface communication line 1, both a relay gateway 1 and a relay gateway 2, which belong to an IP transfer network, a Network to Network (NNI) interface communication line 2, a public switched telephone network 2, and a telephone set 2 ~~in this order~~.

431. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network using a circuit identification code (CIC) to carry out a communication control wherein:

a telephone communication between two telephone sets can be carried out via a telephone set 1, a public switched telephone network 1, a Network to Network (NNI) interface communication line, both a relay gateway and a gateway equipped with a capsulation function, which belong to an IP transfer network, a media router, and a telephone set 2 ~~in this order~~.

432. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein:

an IP transfer network contains two or more connection servers and a terminal 1 outside said IP transfer network transmits a call setting IP packet to a connection server provided on ~~the~~ a telephone calling side,

the connection server on the telephone calling side determines a ~~communication line~~ circuit identification code (CIC) for inter-terminal communication within the IP transfer network by employing both a telephone number provided on the telephone calling side and a telephone number provided on ~~the~~ a call reception side, and produces an initial address message (IAM) for setting telephone calling;

the produced initial address message is transmitted to the connection server on the call reception side via a relay connection server, and the connection server on the call reception side transmits a call setting to a terminal 2 which is on the call reception side;

the connection server on the call reception side forms an address completion message (ACM) and transmits the address completion message via the relay connection server;

upon receipt of a report of telephone calling operation issued from the terminal 2, the connection server on the call reception side forms a call progress message (CPG), the call progress message reaches the connection server on the telephone calling side via the relay connection server, and the connection server on the telephone calling side transmits the report of telephone calling operation of the terminal 2 to the terminal 1 on the calling side;

upon receipt of a response issued from the terminal 2, the connection server on the call reception side produces an answering message (ANM), the answering message reaches the connection server on the telephone calling side via the relay connection server, the connection server on the telephone calling side stops the a calling sound of the terminal 2 on the call reception side, and both the terminal 1 and the terminal 2 can establish an inter-terminal communication between the terminals to transmit and receive a digital media; and

a request for interrupting the inter-terminal communication is transmitted from the terminal 1 or 2 provided on either the telephone calling side or the call reception side to one of the connection servers, a release request message (REL) is transmitted from the connection server to the connection server on another side via the relay connection server, an interrupt instruction is transmitted from the connection server on the other side to the connection server on another side, and on the other hand, a release completion message (RLC) is transmitted from the connection server on the other side via the relay connection server to the server, and an interrupt completion is sent to the terminals so as to release the inter-terminal communication between the two terminals.

433. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 432, wherein:

an initial address message (IAM), a call progress message (CPG), an answering message (ANM), a release request message (REL) and a release completion message (RLC) are transmitted and received between the connection server on the telephone calling side and the connection server on the call reception side; and an address completion message (~~RLC~~ACM) is omitted.

434. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network wherein:

the IP transfer network uses a circuit identification code (CIC) to carry out a communication control and includes at least two network node apparatuses, a media router is connected to any one of the network node apparatuses via an IP communication line, an internal address is notified to a logical terminal at ~~the~~ an end of the IP communication line on ~~the~~ a network node apparatus side, the media router is connected to at least one telephone set through a communication line, an external IP address and the internal address are included as a record of an address management table inside the network node apparatus, an IP communication record for regulating an ~~simple~~ encapsulating method having no originating address in a header of an internal packet is set in advance, and connection control of telephone communication and a release control of telephone communication are performed by employing the IP communication record between the telephone set connected to the media router and another telephone set connected to another media router.

435-447. (canceled)

448. (currently amended) A terminal-to-terminal communication control method,

wherein an IP transfer network is connected to two or more network node apparatuses, said network node apparatus respectively have two or more logical terminals, said network node apparatus are connected to terminals for communicating by using an external packet ~~via said IP transfer network~~ via one of said logical terminals, said network node apparatus communicate with a destination network node apparatus by using an internal packet via said IP transfer network, said network node apparatus has a function to form said internal packet based on said external packet and logical terminals which said external packet inputs and to restore said external packet based on said internal packet, a terminal-to-terminal communication is carries out by using internet protocol via said network node apparatus and said IP transfer network, and said IP transfer network includes a connection phase and a communication phase and registers a record including at least a telephone number, a communication start time and a communication end time.

449. (currently amended) A terminal-to-terminal communication control method according to claim 448, wherein said connection phase is carried out with ~~based on a common channel signaling system including~~ an address completion message.

450. (previously presented) A terminal-to-terminal communication control method according to claim 448, wherein said connection phase includes an answering confirmation message.

451-452. (canceled)

453. (currently amended) A terminal-to-terminal communication connection control method with employment of an IP transfer network according to claim 381 ~~451~~, wherein said ~~call-setting~~ connection control includes an answering confirmation message.

454-466. (canceled)